

## Is negation encoded systematically in homesign systems? An experimental investigation

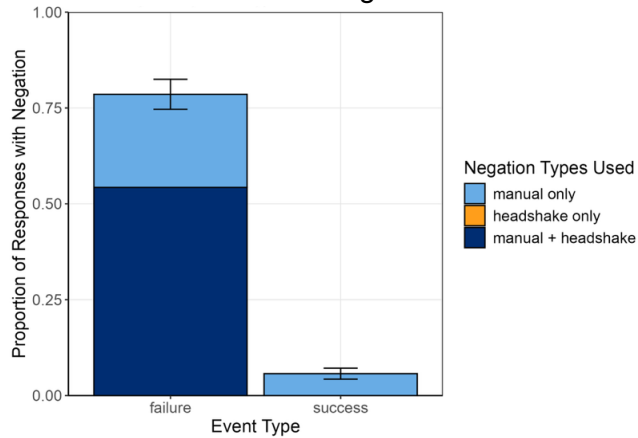
Negation, despite its abstractness, is universally encoded in natural language [1]. Is the systematic mapping between logical operators like negation and linguistic forms enabled by readily available cognitive capacities shared by all learners? Or do such mappings only emerge over generations of language use and transmission? Homesigns—systems of gestures and signs created by deaf individuals who lack exposure to an accessible language [2]—can provide insight into how the linguistic encoding of negation becomes systematic. Homesigns reflect the capacities for language creation of a single individual who has not acquired an existing language. Previous studies of homesign negation, although informative, consisted of rich interpretation of corpus data [3–6]. The lack of controls in this approach limits the ability to compare instances of negation within and between homesigns. Experimental methods are required to rigorously evaluate the systematicity of homesign negation and to explore variation between homesign systems. Here, we elicit corresponding affirmative and negative statements from homesigners using success events and failure events, respectively [7–8].

**Method.** Five adult Nicaraguan homesigners described short videoclips of a human agent attempting a simple action (e.g., turning on a lamp). In success clips, the agent successfully performed the action. In failure clips, the agent failed to perform the action. Success and failure videos differed only in their outcome. Videos were presented by event type in two blocks, each with 14 trials. Participants viewed either the success block first or the failure block first. Two coders, unaware of condition, coded responses for (a) (potential) manual negators, (b) action descriptions (i.e., predicates), and (c) (potential) negative nonmanual markers (which co-occur with manual signs). Headshake was the principal negative nonmanual marker examined since it is the most prominent nonmanual negator in sign languages. Brow furrow, downturned mouth, nose wrinkle, and tongue protrusion were also explored. To determine whether homesigners distinguished failure from success descriptions using negation, multilevel logistic regressions were performed to predict the presence of manual and/or headshake negation from event type, block order, and their interaction. We operationalized systematicity as (a) consistent position of the manual negator relative to the predicate, (b) consistent nonmanual marker spread (over the manual negator and/or predicate), and (c) lexically-specified negative nonmanual markers (i.e., manual negators obligatorily accompanied by particular nonmanual markers).

**Results and Discussion.** Homesigners used negation more often to describe failures than successes (Figure 1). Use of negation did not vary by block order, in line with prior results for English-speaking adults and children [8]. Within responses, manual-only and manual + headshake negation were observed, but not headshake-only negation. Headshake-only negation has been reported in past studies of homesign [3,6] but may be rare [6]. Homesigners shared a strong preference for post-predicate manual negation (Figure 2). Headshakes tended to co-occur with the manual negator only (Figure 3), not spreading over the clause as is observed in many sign languages [9]. The other nonmanual markers also seemed associated with negation, being more frequent in failure than success descriptions; however, their spread patterns differed from the headshake (more variable and/or less tied to the manual negator). Some homesigns may have lexically-specified nonmanual markers (e.g., tongue protrusion with a manual negator expressing nonexistence; see also [6]). In sum, homesign negation seems systematic, as demonstrated by consistent manual negator position. That the cross-linguistic tendency in sign languages toward post-predicate manual negation [9] emerges in homesign suggests underlying shared biases or constraints. Headshakes may become an autonomous negator only over time in a language community [10,11]. We will also analyze responses from homesigners' communication partners in the same task (data collected), to assess effects of the homesign system's status as a primary versus secondary system of communication.

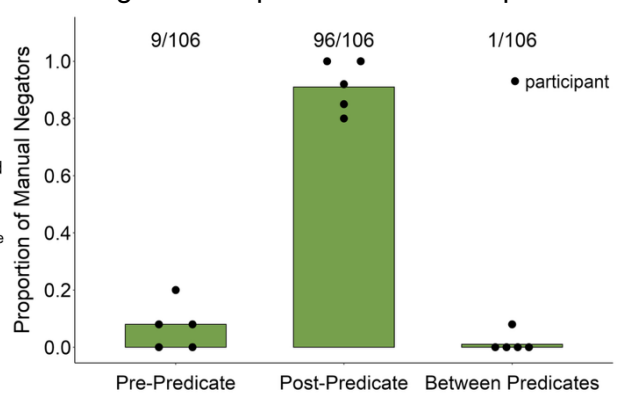
**Figure 1.**

Failure events elicit negation

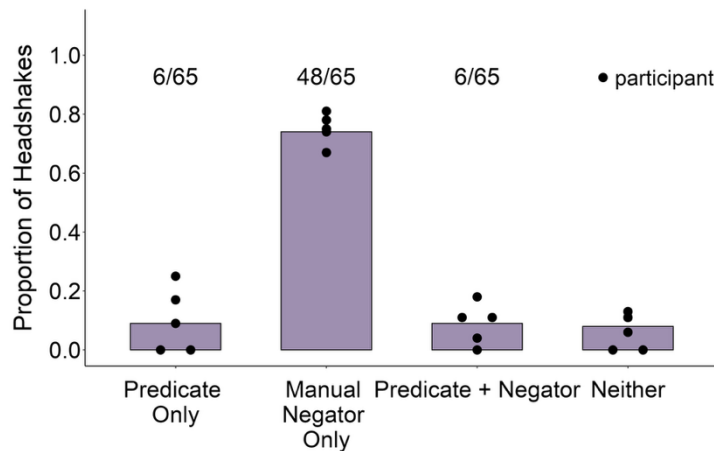


**Figure 2.**

Manual negators are produced after the predicate



**Figure 3.** Headshakes primarily co-occur with manual negator only



**References.** 1. Horn, L.R. 1989. *A natural history of negation*. Chicago: University of Chicago Press. 2. Goldin-Meadow, S. 2003. *The resilience of language*. New York: Psychology Press. 3. Franklin, A., A. Giannakidou & S. Goldin-Meadow. 2011. Negation, questions, and structure building in a homesign system. *Cognition* 118(3). 398–416. <https://doi.org/10.1016/j.cognition.2010.08.017> 4. Kan, U., K. Gökgöz, B. Sümer, E. Tamyürek & A. Özyürek. 2022. Emergence of negation in a Turkish homesign system. In A. Ravignani et al. (eds.), *Proceedings of JCoLE*, 387–389. <https://doi.org/10.17617/2.3398549> 5. Neveu, G. 2016. *Sign order and argument structure in a Peruvian home sign system*. Master's thesis, University of Texas at Austin. 6. Prasodjo, S., N. Palfreyman & C. de Vos. 2025. Negation in Balinese homesigners. Conference presentation, TISLR 15, Ethiopia. 7. Gomes, V., Y. Huh & J. Trueswell. 2020. Not what you expect: The relationship between violation of expectation and negation. <https://doi.org/10.17605/OSF.IO/MD832> 8. Gomes, V., Y. Huh, H. Yun & J. Trueswell. 2026. Failure is always an option: Event failures serve as minimal discourse contexts for early negator use and inference. *Cognition* 267. 106342. 9. Zeshan, U. 2004. Hand, head, and face: Negative constructions in sign languages. *Linguistic Typology* 8(1). 1–58. <https://doi.org/10.1515/lity.2004.003> 10. Lutzenberger, H., R. Pfau & C. de Vos. 2022. The case of negation in Kata Kolok. *Languages* 7(1). 23. <https://doi.org/10.3390/languages7010023> 11. Pfau, R. 2015. The grammaticalization of headshakes: From head movement to negative head. In A.D.M. Smith et al. (eds.), *Studies in Language Companion Series* 166. 9–50. Amsterdam: John Benjamins. <https://doi.org/10.1075/slcs.166.02pfa>